FIG.1

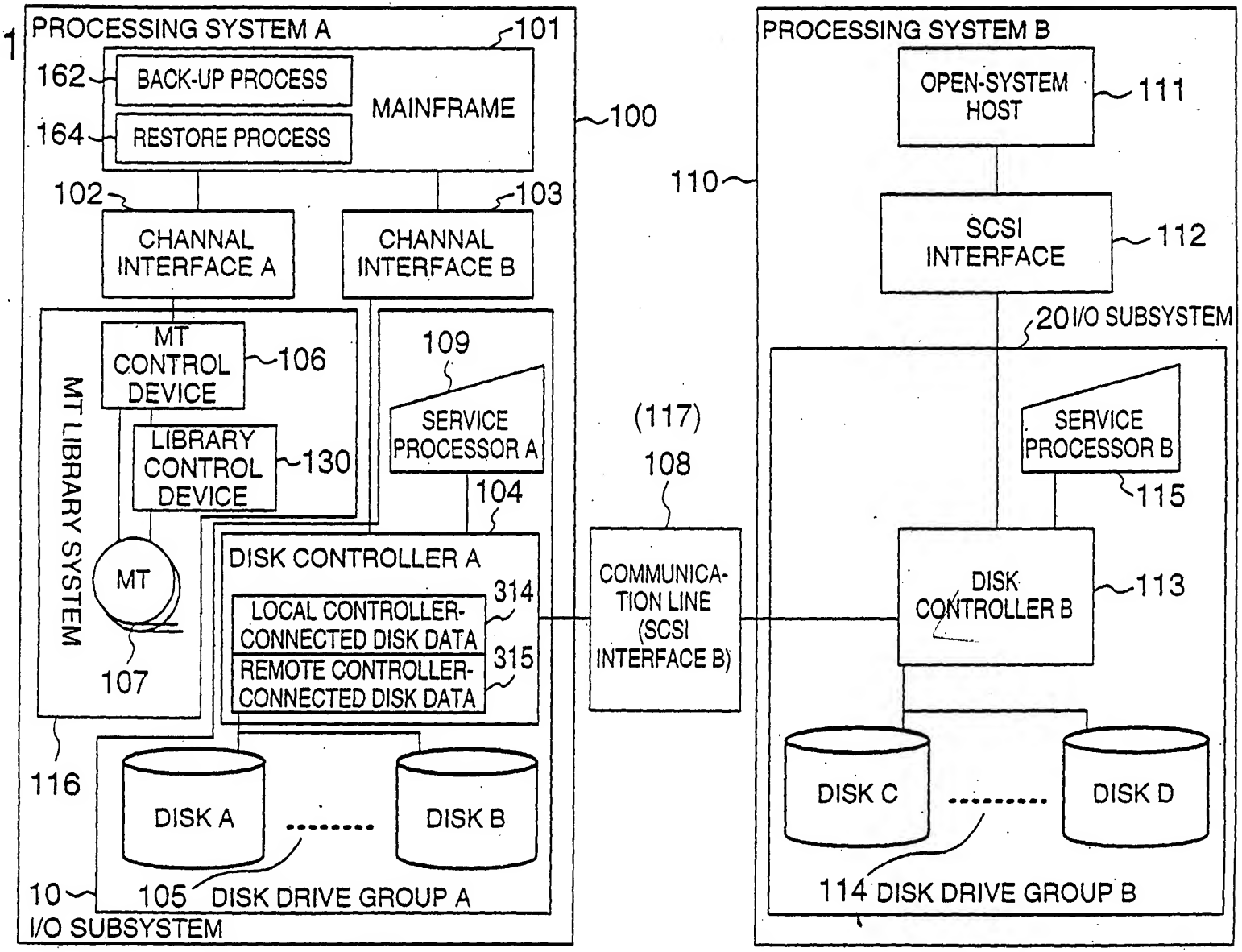

PROCESSING SYSTEM A
101
162
BACK-UP PROCESS
164
RESTORE PROCESS
MAINFRAME
100
102
103
CHANNAL INTERFACE A
CHANNAL INTERFACE B
MT LIBRARY SYSTEM
MT CONTROL DEVICE
106
LIBRARY CONTROL DEVICE
130
MT
107
109
SERVICE PROCESSOR A
104
DISK CONTROLLER A
LOCAL CONTROLLER-CONNECTED DISK DATA
314
REMOTE CONTROLLER-CONNECTED DISK DATA
315
116
DISK A
DISK B
10
105 DISK DRIVE GROUP A
I/O SUBSYSTEM
(117)
108
COMMUNICATION LINE (SCSI INTERFACE B)
PROCESSING SYSTEM B
OPEN-SYSTEM HOST
111
110
SCSI INTERFACE
112
20 I/O SUBSYSTEM
SERVICE PROCESSOR B
115
DISK CONTROLLER B
113
DISK C
DISK D
114 DISK DRIVE GROUP B

FIG.2

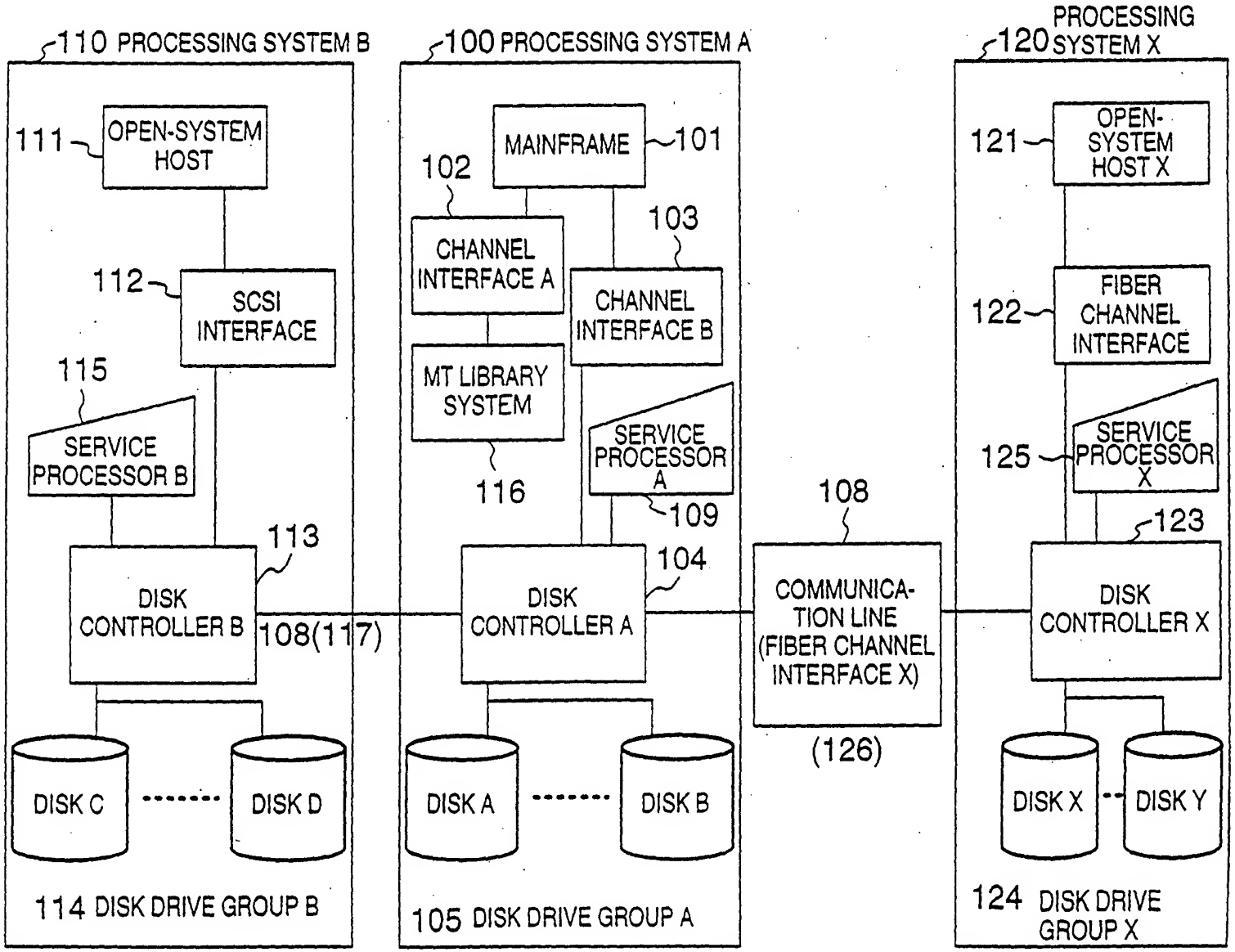

110 PROCESSING SYSTEM B
100 PROCESSING SYSTEM A
120 PROCESSING SYSTEM X
111
OPEN-SYSTEM HOST
112
SCSI INTERFACE
115
SERVICE PROCESSOR B
113
DISK CONTROLLER B
108(117)
DISK C
DISK D
114 DISK DRIVE GROUP B
102
MAINFRAME
101
103
CHANNEL INTERFACE A
CHANNEL INTERFACE B
MT LIBRARY SYSTEM
116
SERVICE PROCESSOR A
109
104
DISK CONTROLLER A
DISK A
DISK B
105 DISK DRIVE GROUP A
108
COMMUNICATION LINE (FIBER CHANNEL INTERFACE X)
(126)
121
OPEN-SYSTEM HOST X
122
FIBER CHANNEL INTERFACE
125
SERVICE PROCESSOR X
123
DISK CONTROLLER X
DISK X
DISK Y
124 DISK DRIVE GROUP X

FIG.3

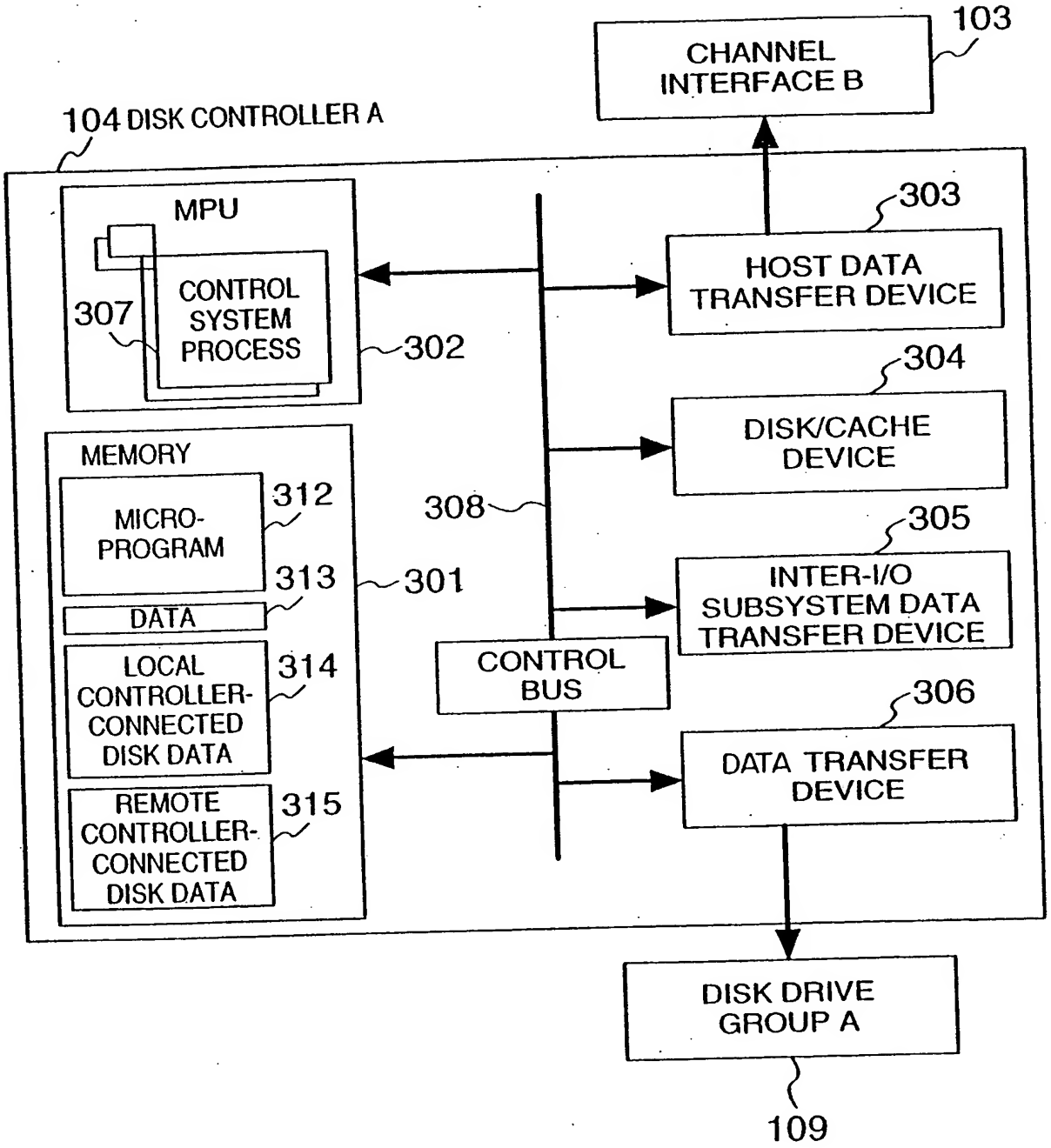

CHANNEL INTERFACE B
103
104 DISK CONTROLLER A
MPU
CONTROL SYSTEM PROCESS
307
302
303
HOST DATA TRANSFER DEVICE
304
DISK/CACHE DEVICE
MEMORY
MICRO-PROGRAM
312
313
DATA
301
308
305
INTER-I/O SUBSYSTEM DATA TRANSFER DEVICE
LOCAL CONTROLLER-CONNECTED DISK DATA
314
CONTROL BUS
306
DATA TRANSFER DEVICE
REMOTE CONTROLLER-CONNECTED DISK DATA
315
DISK DRIVE GROUP A
109

FIG.4

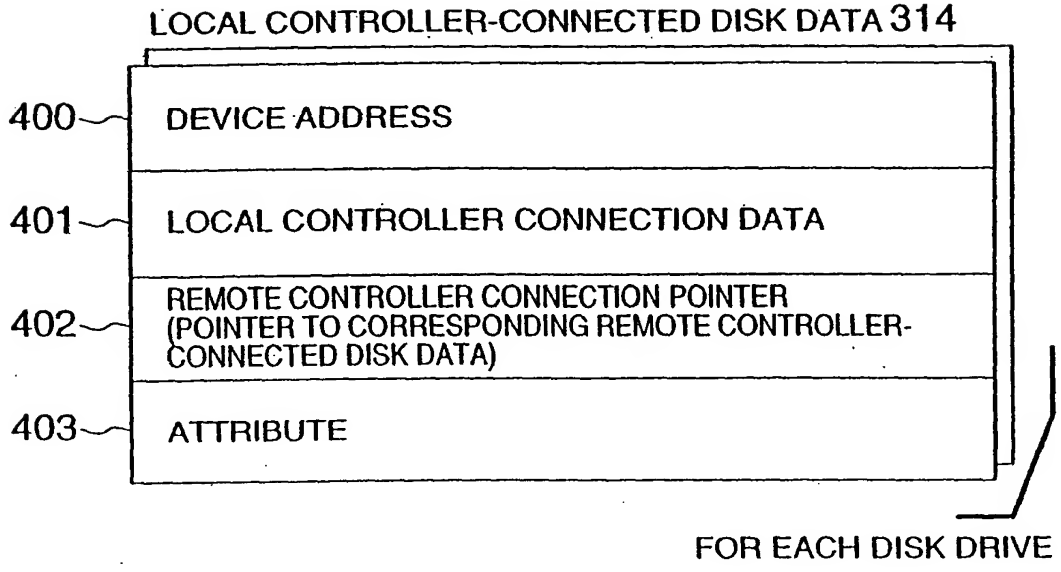

LOCAL CONTROLLER-CONNECTED DISK DATA 314
400
DEVICE ADDRESS
401
LOCAL CONTROLLER CONNECTION DATA
402
REMOTE CONTROLLER CONNECTION POINTER (POINTER TO CORRESPONDING REMOTE CONTROLLER-CONNECTED DISK DATA)
403
ATTRIBUTE
FOR EACH DISK DRIVE

FIG.5

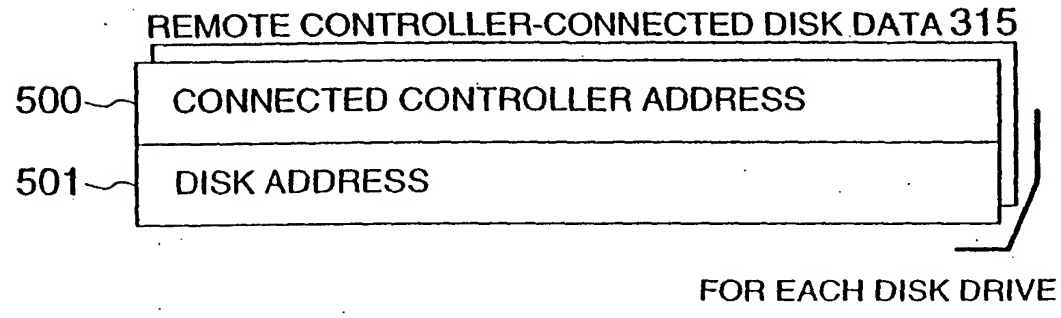

REMOTE CONTROLLER-CONNECTED DISK DATA 315
500
CONNECTED CONTROLLER ADDRESS
501
DISK ADDRESS
FOR EACH DISK DRIVE

FIG.6

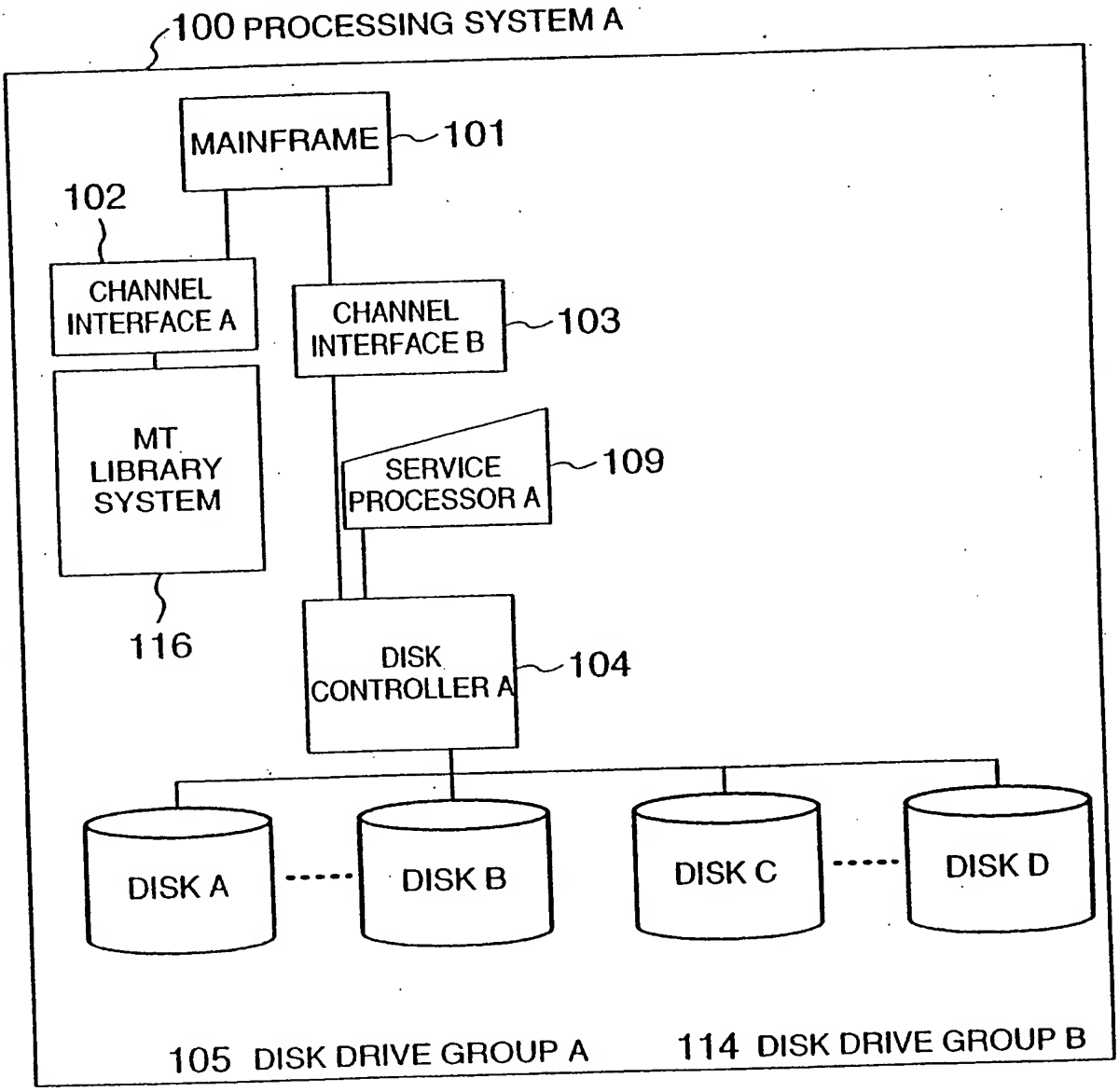

100 PROCESSING SYSTEM A
MAINFRAME
101
102
CHANNEL INTERFACE A
CHANNEL INTERFACE B
103
MT LIBRARY SYSTEM
SERVICE PROCESSOR A
109
116
DISK CONTROLLER A
104
DISK A
DISK B
DISK C
DISK D
105 DISK DRIVE GROUP A
114 DISK DRIVE GROUP B

FIG.7

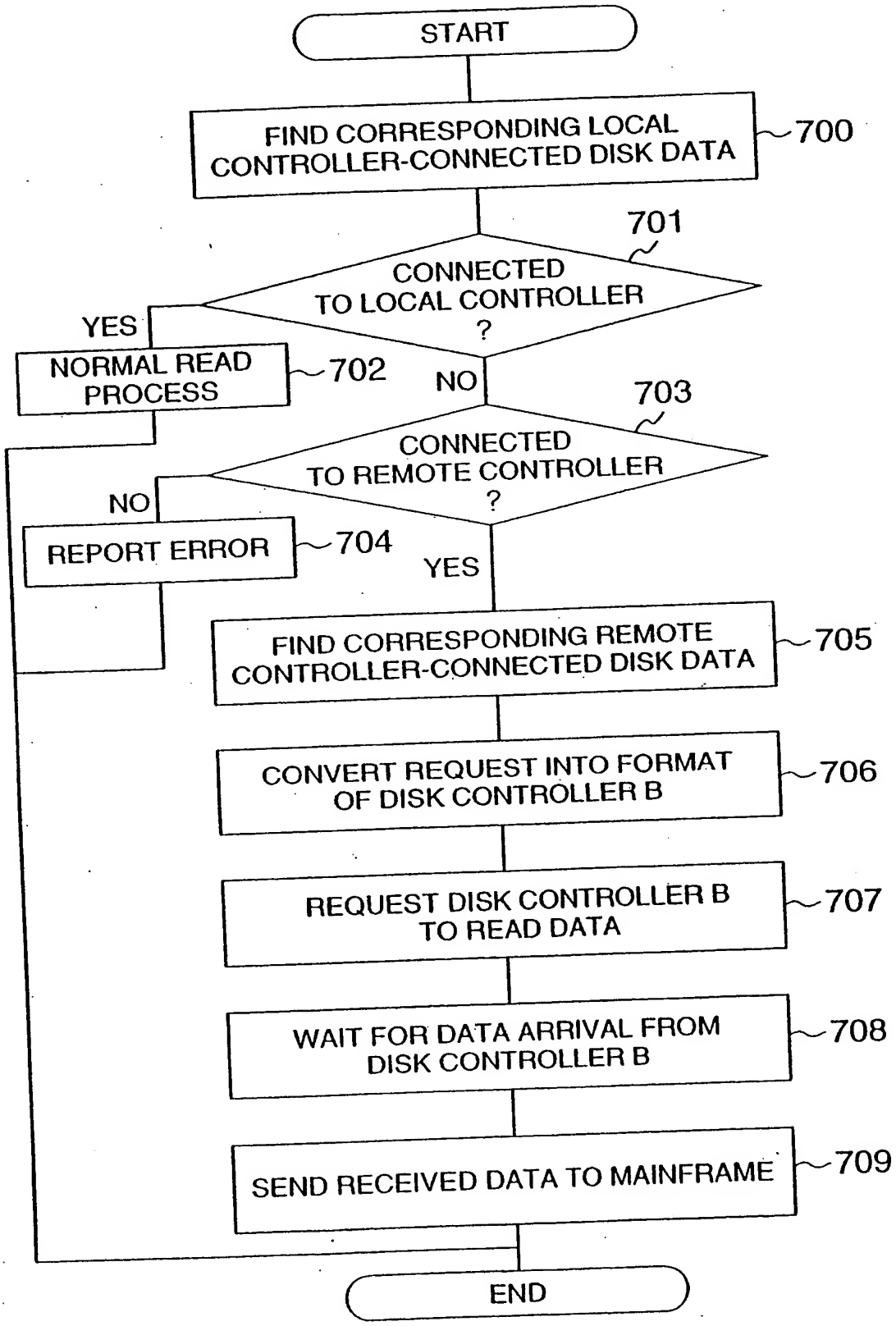
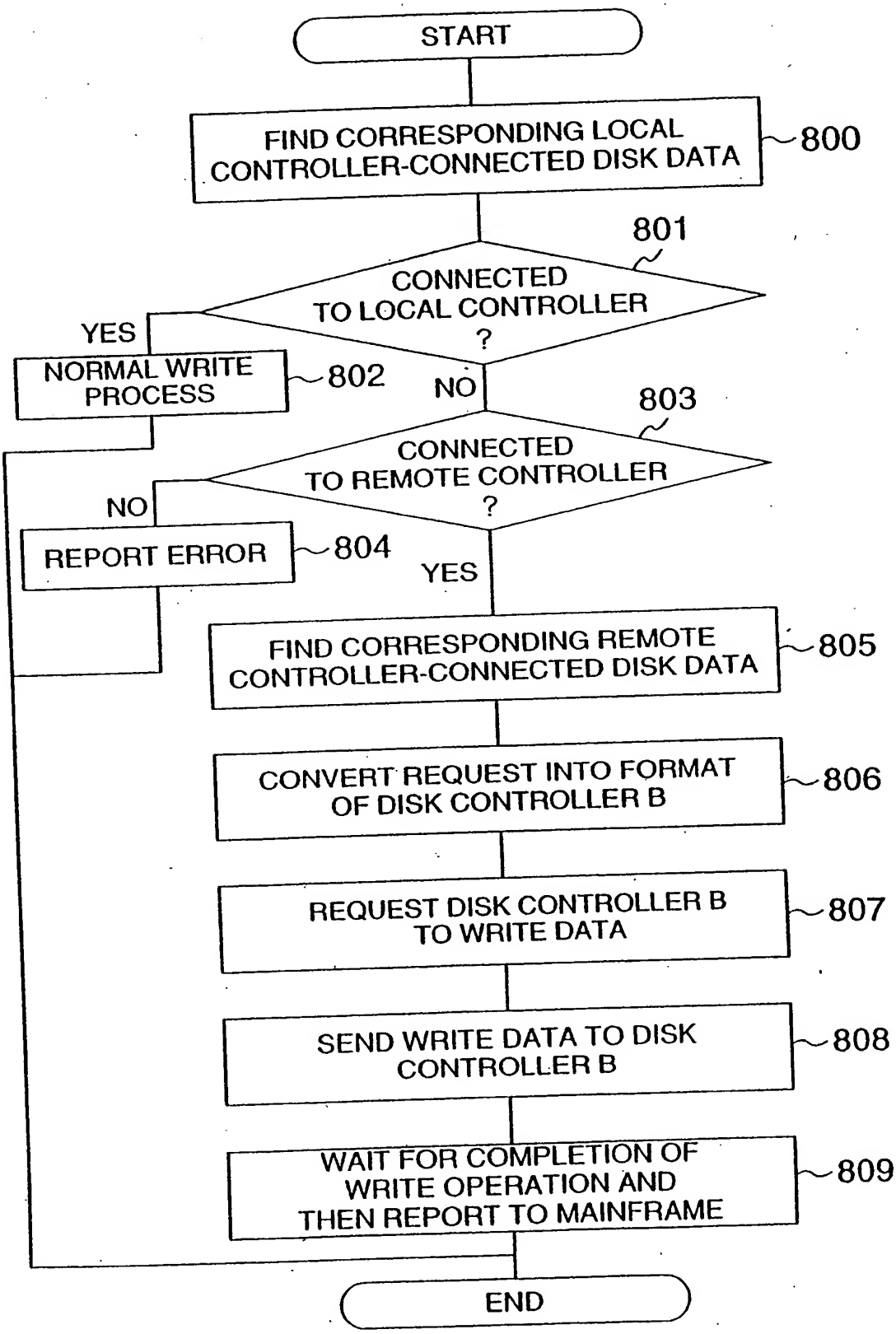

START
FIND CORRESPONDING LOCAL CONTROLLER-CONNECTED DISK DATA
700
701
CONNECTED TO LOCAL CONTROLLER ?
YES
NORMAL READ PROCESS
702
NO
703
CONNECTED TO REMOTE CONTROLLER ?
NO
REPORT ERROR
704
YES
FIND CORRESPONDING REMOTE CONTROLLER-CONNECTED DISK DATA
705
CONVERT REQUEST INTO FORMAT OF DISK CONTROLLER B
706
REQUEST DISK CONTROLLER B TO READ DATA
707
WAIT FOR DATA ARRIVAL FROM DISK CONTROLLER B
708
SEND RECEIVED DATA TO MAINFRAME
709
END

FIG.8


START
FIND CORRESPONDING LOCAL CONTROLLER-CONNECTED DISK DATA
800
801
CONNECTED TO LOCAL CONTROLLER ?
YES
NORMAL WRITE PROCESS
802
NO
803
CONNECTED TO REMOTE CONTROLLER ?
NO
REPORT ERROR
804
YES
FIND CORRESPONDING REMOTE CONTROLLER-CONNECTED DISK DATA
805
CONVERT REQUEST INTO FORMAT OF DISK CONTROLLER B
806
REQUEST DISK CONTROLLER B TO WRITE DATA
807
SEND WRITE DATA TO DISK CONTROLLER B
808
WAIT FOR COMPLETION OF WRITE OPERATION AND THEN REPORT TO MAINFRAME
809
END